DOI 10.1007/s10553-017-0829-z
Chemistry and Technology of Fuels and Oils, Vol. 53, No. 4, September 2017 (Russian Original No.4, July– August, 2017)

RESEARCH

LOW-TEMPERATURE OXIDATION OF HEAVY OIL IN CARBONATE MEDIUM USING COBALT (III) ACETYLACETONATE AS CATALYST

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The results of laboratory experiments on modeling of heavy oil oxidation processes in an air-oxygen environment using cobalt (III) acetylacetonate as catalyst at temperatures and pressures typical of thermal production methods are presented. It is established that the high-molecular components of the heavy oil are degraded in the air-oxygen environment at temperatures above 250°C in the presence of the catalyst with formation of low-boiling hydrocarbon fractions and oxygen-bearing compounds, and this reduces the density and viscosity of the transformed oil. In addition, the products obtained in the experiments show an increased asphaltene content and the presence of finely disperse carbonaceous substances, indicating the occurrence not only of cracking, but also of condensation processes. The experimental data indicate the main directions of the reactions and transformations of heavy oil hydrocarbon components in the studied systems, which provides the possibility of using cobalt acetylacetonate as a catalyst in the in-situ low-temperature oxidation of heavy oil in carbonate reservoirs.

Keywords: *thermal degradation, heavy oil, cobalt acetylacetonate, low-temperature oxidation, cracking, carbonate reservoir.*

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